

NAAML P

NATIONAL ASSOCIATION OF ABANDONED MINE LAND PROGRAMS

NEWSLETTER
 Fall 2013 Vol. 35 No. 1

INSIDE

President’s Message
 NAAML P 2013 Conference.....2
 Winter Meeting3
 ECHO Award4
 Stan Barnard Award.....4
 Dave Bucknam Award4
 NAAML P Scholarships.....5
 Todd Coffelt.....5
 National Award6
 Appalachian Region Award8
 Mid-Continent Region Award.....9
 Western Region Award11
 Small Project Award12
 IGS Publishes Book.....14

UPCOMING MEETINGS

2014 Winter Business Meeting
 Anchorage, AK February 27 - 28

MISSION STATEMENT

1. To provide a forum to address current issues, discuss common problems and share new technologies regarding abandoned mine land reclamation;
2. To foster positive and productive relationships between the states and tribes represented by the Association and the federal government;
3. To serve as an effective, unified voice when presenting the states'/ tribes' common viewpoints; and
4. To coordinate, cooperate and communicate with the Interstate Mining Compact Commission, Western Interstate Energy Board and all other organizations dedicated to wise use and restoration of our natural resources.

Dear Membership,

I am honored to serve as NAAML P president for the next year and continue the commitment of those that came before me to carry out the mission of this great organization. I greatly appreciate the support and guidance I’ve received these last few years from Todd Coffelt, Madeline Roanhorse, Mike Garner, Loretta Pineda and the many other members who’ve helped me learn the NAAML P ropes.

In these legislatively uncertain times, it is critical that we continue to share successes, address current and future administrative and legislative issues, discuss common problems, and share technological advances in the reclamation of abandoned mine lands. As AML grant amounts begin the down-hill side of the funding curve toward significantly lower levels, it is going to be more important than ever to remain unified, share our knowledge and work together to increase our efficiency and effectiveness in the restoration and use of our natural resources.

The ongoing national budget battles necessitate our continued effort to communicate to Congress the real-world reality, that AML grants are committed as quickly as possible to high priority on-ground reclamation projects. Our new Secretary Treasurer, Chuck Williams, has graciously volunteered to coordinate collecting and preparing this important financial data for the Association. Please be sure to get your state or tribal data to him as soon as is possible.

With potential SMCRA reauthorization only seven years away, NAAML P, IMCC, and OSM must begin to coordinate, communicate and cooperate in order to develop a unified voice and define common ground in representing the states and tribes as we move through the process. Our task this year is to develop a vision and establish a working group to guide NAAML P through the reauthorization process as it begins to gain momentum. I look forward to working with VP Eric Cavazza and Greg Conrad on this important initiative.

In closing, I’d like to give a hearty thanks to our West Virginia colleagues for putting on a great conference in a very beautiful part of the country. The technical presentations and field trips were excellent and enjoyed by everyone. Here’s to a busy and successful year for all, and I hope to see you again at the winter meeting in Anchorage and next year’s conference in Ohio.

Best Regards, Bruce Stover



2013 NAAMLPL Conference

The honor of hosting this year's NAAMLPL conference was given to West Virginia. The 35th occurrence of this event was a success thanks to the support of the states and tribes that comprise the National Association of Abandoned Mine Land Programs, the team work of the people working for the WVDEP – Office of Abandoned Mine Lands and the continued support of the sponsors and exhibitors who participated actively in the showrooms and the technical sessions offered to the attendees.





Over 200 people participated in all conference activities (195 were registered as attendees); they enjoyed not only the beauty of the State of West Virginia, but also an excellent plenary session enlightened by the illustrious Congressman Nick Joe Rahall II. The subject of our conference “Innovating at the present, focused on a successful future” was also well served by the high quality presentations, targeted to deliver knowledge and proof of innovative techniques and methodologies to solve diverse AML problems and to ensure the continuous fulfillment of the mission given by SMCRA.

Thanks to all!!



2014 NAAML P Winter Meeting, February 27 - 28

The National Association of Abandoned Mine Land Programs (NAAML P) Winter Business Meeting will be held in Anchorage, Alaska on February 27-28, 2014, at the [Hilton Hotel](#) located in downtown Anchorage. The hotel is approximately 15 minutes from the Anchorage International Airport. Committee meetings will be held during the afternoon of February 27th in the Dillingham/Katmai Conference room. The business meetings will be held all day on February 28th in the same conference room.

RESERVATIONS:

[Hilton Anchorage](#) rate is \$99/night plus taxes (single/double occupancy), rate and room availability is good until February 4, 2014.

Call 1-800-HILTONS for reservations; ask for ‘Winter Meeting’ special rates.

Online reservations at www.hiltonanchorage.com ; enter ‘NAAML P’ in the group code box.

Special Rates available to be used three days prior and three days after meeting dates.

Valet Parking is \$24/night, no Self Parking available. Link to [Parking Lots](#) in Downtown Anchorage:

Downtown Anchorage will be busy during this time as the NAAML P meetings coincide with Fur Rendezvous and the start of the Iditarod dog sled race, both of which are traditional Alaskan events.

****Special Note:** The end of February has typical daytime temperatures that can be below 20 degrees F. Evening temperatures frequently drop well below 10 degrees F. The wind chill factor can drop the temperature another 10 degrees. If you plan on enjoying our state’s great outdoors at all, please bring appropriate clothing for the season.**

NEARBY ATTRACTIONS / EVENTS:

[Fur Rendezvous](#) – Annual festival celebrating Alaskan history. The world famous [Iditarod](#) sled dog race starts at the end of the Fur Rondy in downtown Anchorage.

[Bears Tooth Theatre Pub](#) – A short taxi ride from downtown to this theatre pub rewards you with freshly prepared food, draft beer and wine for consumption inside the theatre while enjoying one of the theatre’s eclectic selections of movies.

[Anchorage Museum](#) – This downtown museum at Rasmuson Center celebrates Alaska as well as art, history and science from around the world. The Center includes the Imaginarium Discovery Center, the Thomas Planetarium and the Smithsonian Arctic Studies Center.

[Alaska Center for the Performing Arts](#) – Known locally as the PAC, this performance venue hosts theatre, dance, music and art productions from around the world.

ECHO Award - John Husted

Mr. Husted served the Ohio Division of Mineral Resources Management for 35 years, working his way from Reclamation Inspector to Manager of the Ohio Abandoned Mine Lands Emergency Program, and finally to Chief of the Division. Throughout his long career, John worked and managed all aspects of SMCRA from the State program perspective. During his tenure as Emergency Program Manager, he was instrumental in the development of Ohio's "Ask Before You Build Development Guide." This proactive effort established additional eligibility criteria for AML program funding and stressed the importance of evaluating the presence of abandoned mine land issues prior to site development by local jurisdictions, developers, and landowners.

John was instrumental in coordinating the development and management of the Ohio Mine Subsidence Insurance Program as well. John was very active in the NAAML. He was past secretary/treasurer, vice present and president. He was also a very active participant with the Interstate Mining Compact Commission, an organization that represents States and Tribes with active coal mining.

John served on various boards including the Appalachia Ohio Alliance after his retirement. He volunteered extensively throughout his life as an environmentalist by planting thousands of trees, locally directing the efforts to stop erosion in Glen Echo Ravine, and helping to improve watersheds both on and off the job.

Considering all of John's contributions and attributes, this award is a fitting posthumous tribute to his dedication and service in carrying out all of the principles of SMCRA. Sadly, John is no longer with us due to his untimely passing earlier this year in a snorkeling accident.



Stan Barnard Award - Mike Garner

Mike Garner graduated from Frostburg State University in 1989 with a B.S. degree in Environmental Analysis and Planning. Since graduation, Mike has held the positions as an AML Project Designer, the Director of the Maryland Abandoned Mine Land Program and the Director of the Maryland Bureau of Mines which regulates Maryland's active coal mining industry. Mike was also an officer in the NAAML from 2008 to 2011.



Dave Bucknam Award - Eric Perry

Eric Perry is a Hydrologist with the Office of Surface Mining, Appalachian regional office. He has been an instructor for the National Technical Training Program (NTTP) and the Technical Innovation and Professional Services (TIPS) programs for over 20 years. His instructional base includes classes in acid forming materials, quantitative hydrogeology, OSM's Instructor Training Course, soils and revegetation, groundwater flow modeling, statistical analysis, water quality, water treatment and geochemistry. Training applications include remediation of abandoned mined lands as well as active mining issues. He was a member of OSM's Indonesia project team and conducted on site training in mine drainage and hydrology for the program. When he's not instructing, Eric works on mine-pool studies, mine water remediation, and TIPS hydrology software.

Eric has degrees in Soil Science, and a PhD in Geology from West Virginia University. His current "hobby" is part time teaching for the Geology program at the University of Pittsburgh. Eric resides with his wife and son in McMurray, Pennsylvania.





Katherine Stockdale, Jessica Odenheimer, Rachel Powell

Western Recipient – Rachel Powell

Rachel Powell graduated from the University of New Mexico in May 2012. Her field of study was Environmental Science where she received a Bachelors of Science. Presently, she is working on the Masters of Science in Civil Engineering with emphasis in Environmental Engineering at the University of New Mexico

Her thesis work involves the preparation of a potentiometric surface map of the production zone of Santa Fe Aquifer in the Albuquerque Basin, indicating changes caused by pre-development, climate change and pumping. During her undergraduate studies, Ms. Powell worked as an intern for the U.S. Geologic Survey's New Mexico Water Science Center, where she has worked on various projects dealing with water quality and quantity.

Outside of work and study Ms. Powell has been involved in volunteer work with MathCounts – a program helping middle school students with math, QSA – being a big sister to incoming freshman at UNM, and ANEW – finding homes for stray pets. She is looking forward to a career in protecting the land by finding better ways to extract minerals during mining.

Eastern Recipient – Jessica Odenheimer

Jessica Odenheimer graduated from Virginia Tech in 2011 with a BS in Environmental Science. At this time, she is working on her Masters in Science at West Virginia University. In her master thesis she is developing a laboratory methodology to determine the potential for release of total dissolved solids from weathering overburden materials. Her team will take this information and attempt to develop a technique to be used to analyze overburden materials. This will help indicate which materials need to be separated, isolated and specially handled to help minimize detrimental impacts to water and the environment.

For two years during her time as an undergraduate, Ms. Odenheimer worked as a Soils Laboratory Assistant at Virginia Tech. During the summer and winter breaks of her undergraduate studies, she interned at the Science Applications International Corporation. For the past two years, she has been helping others through the EnvironMentors program. This program was developed to pair high school students with older mentors. This year, her high school partner won the second place scholarship at the National Science Fair in Washington, D.C. She is looking forward to a career in reclaiming lands affected by past mining.

Mid Continent Recipient – Katherine Stockdale

Katherine Stockdale is a 2nd year senior attending Missouri University of Science and Technology (MUS&T) in Rolla, Missouri. She is currently studying to complete her degree in Geological Engineering with minors in Biology, Geology and Explosives. Since 2010 Katherine has been very active with the MUS&T Mining Competition Team, this year acting as team captain.

To prepare for her career in reclamation, Ms. Stockdale has worked with the U.S. Forest Service by surveying culverts with Doe Run Company as a geology intern, and with Barrick Cortez, Inc. as a geotechnical intern. Ms. Stockdale would like to pursue a career in mine reclamation by working for a consulting company as a reclamation engineer.

Todd Coffelt Gets A New Job

NAAML P Delegates - I want to share with everyone that I have accepted a position with the Iowa DNR as Chief of the State Parks Bureau and will begin my new duties on November 22.

I want to thank everyone for the friendships and opportunities that have come from this organization over the last 14 years. I have had the pleasure of meeting many great people doing great things through the NAAML P. The NAAML P has been a great vehicle for the Iowa AML Program to reinforce the purpose of our efforts at the local level. I wish each of you the best in the coming days as you undertake the re-authorization effort. There is no doubt in my mind that each program is endeavoring to achieve excellence in reclamation.

My best to you – Todd A. Coffelt

Susan Kozak will be serving as the Acting Bureau Chief for the interim. Susan.Kozak@iowaagriculture.gov or 515-242-5003

Newtown South II 2 Project - Pennsylvania



Blackwood Breaker ca. 1930

National Award Winner

Newtown South II – 2 is located in the Southern Anthracite Coal Field, 40 miles northeast of Harrisburg, in Schuylkill County, Pennsylvania. The site had been underground mined over 80 years. Drainage to the Northern Swatara Creek and its tributaries is 577 square miles with the upper 43 square miles in the coal field. Several surface and a few underground mines are active today in the watershed, however most were abandoned in the 60's.

The watershed was covered by steep-sided mine pits, steep banks of barren spoil and culm, and fine coal waste in silt basins. Mine openings and subsidence allowed for surface water drainage. Further downstream, the contaminated water discharged from abandoned mine drainage sources. This has drastically hurt the fish population in the northern 12-mile portion of the Swatara Creek, making it a candidate for reclamation. The area did have a lot of visitors, evidenced by spent shotgun shells, footprints, and tire tracks. Bottles, cans, and paper wrappings were littered throughout the top and bottom of the pit, and trash had been dumped throughout the site. It was estimated that 5,000 hunters visited annually.

The project regraded 50 acres of abandoned mine lands and reclaimed three vertical openings, and four hazardous water bodies. Two water seeps and one discharge were treated using the limestone beds and wetlands that were created. Three water filled pits' highwalls reached 20 feet above the water's surface. These and four strip pits had a combined total of 1200 foot of highwall.

Special treatment systems were used on three mine discharges, called "Automatic Flushing Up-Flow Limestone Bed Treatment Systems, with Polishing Aerobic Wetlands". These systems had not been used by the bureau previously. To prevent debris from entering the system, the mine discharges are

directed to rock filtered intake chambers, conveyed by plastic piping to PVC-lined limestone beds with perforated plastic outflow pipes. The water flows through the limestone bed, through the wetlands and discharges into the creek. This treatment system needs to be back-flushed twice a week into settling ponds. The intent of up-flow limestone beds is to have the metals precipitate closer to the perforated flush pipes rather than on top of the bed.

The project land is inside the Pennsylvania State Game Land 229. This land was either donated by individuals or Pennsylvania State Game purchased them with hunting and fishing license fees. 13% of the funding was from Pennsylvania's Title IV Non Water grant, and 87% from Pennsylvania's Growing Greener II program, which is the largest single investment of state funds in the state's history to address critical environmental concerns. Pennsylvania Bureau of Abandoned Mine Reclamation met with Game Commission officials for design planning. They suggested tree and grass seed mixtures to benefit the local wildlife. 12 bluebird boxes, four wood duck boxes, a bat gate and mallard rings were incorporated into the project.

Treatment system being installed



Tour group of legislators, watershed people and local officials



The game commission also suggested timbering the property prior to the start of construction. To prevent compaction of the area, soil nutrients and tree seed were hydroseeded and then mulched from outside the 50 foot perimeter.

The resulting landscape conforms to the natural environment. The Pennsylvania Game Commission did selective timbering on the project area before the contractor began clearing and grubbing. All natural growth, downed timber, logs, trees, poles, roots, stumps and brush cleared and grubbed from the grading areas were placed in brush piles to act as erosion and sedimentation controls and wildlife habitat, or for the brush barrier core units of the above tree planting areas. The landscape of the completed project resembles approximate original contour. A game-cover seed mixture was used on a bulk of the grading areas. Stones and stumps were strategically placed in the constructed wetlands to provide wildlife habitat.

Wet ground conditions created on-site difficulties. A “diversion and care of water” item was added into the contract to address this. The contractor was able to use a variety of resources to deal with water infiltration and flow issues. Additional diversion ditches and sumps for pumping water were needed. The contractor resolved instability of the

AMD treated by Newtown South II - 2



sidewalls of the treatment cells and inlet ponds with timber mats to support and distribute the equipment load. Railroad property proximity also proved a challenge, having to build treatment sites in muddier areas.

Since the projects completion, black bear, white tail deer, turkey, pheasant, grouse, black snakes, ducks, geese and snapping turtles have all been seen, great for a state with 25% of it’s adults calling themselves “hunters”. Hunting has been and continues to be a tradition within the watershed. State Game Land 229 is now the most used land for hunting in the watershed because of its proper seed mixtures and open fields. Newtown South II-2 has preserved, maintained and enhanced wildlife habitat areas and has been restoring water quality and the fishery for increased recreational opportunities. Closeness to the state capitol has made tours easy for state legislators, government officials and environmental groups, therefore increasing public awareness as well.

Treatment system solar-powered valve



Pennsylvania DEP Bureau of Abandoned Mine Reclamation

Newtown South II - 2 Fall 2012



Three Fork Creek Watershed Restoration Project - West Virginia

Appalachian Regional Award

In West Virginia's Preston and Taylor counties, in the northern part of the state, lies Three Fork Creek. Once known as a premier trout stream, Three Fork Creek was left discolored and lifeless from mine drainage. There were fewer than five mines reported producing coal in these counties, but due to the expansion of the Baltimore and Ohio Railroad in the late 1800's, extensive underground coal mining increased, leaving approximately 9,000 acres of untreated and discharging mine pools throughout the headwaters.

More recently, Three Fork Creek and Lake has been used extensively for boating and fishing. Two state parks close by drew in recreational users, therefore boosting the economy. The drainage area from the mines in Three Fork Creek was over 100 square miles and was characteristically low in pH and high in metals. Mining's impact to aquatic life, high visibility and recreational usage from state parks and the local economy made the area a prime candidate for restoration.

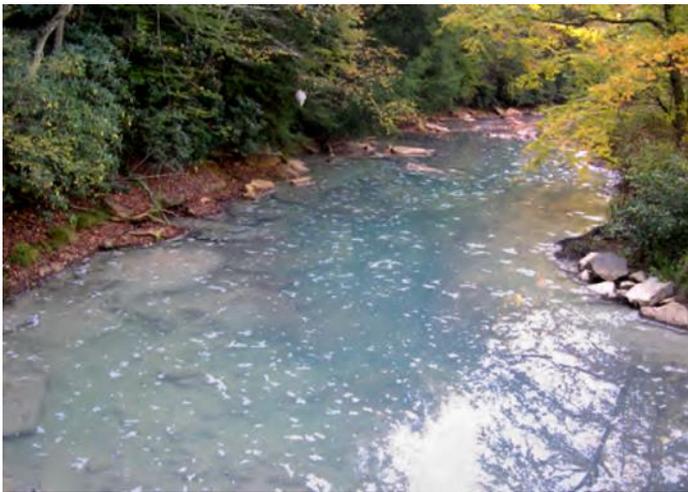


WVDEP personnel partner with Save the Tygart Watershed group on 2012 fish survey

treatments have been used in West Virginia in the past, but in this watershed with high metals, low pH, steep topography and narrow valleys, a traditional approach just wasn't right.

A new cost-effective approach to treating multiple discharges was necessary; an in-stream, lime dosing active treatment. Four lime dosers were placed in headwater tributaries of Three Fork Creek. Each doser included an intake located on the edge of the stream that diverted water from the stream to the doser via an underground pipe, the actual doser mechanism enclosed in a steel building, a steel lime storage silo, and an outlet leading to the stream. Two types of dosers were utilized: one using a water-powered tipping bucket to dispense lime at each tip and three using a water wheel to turn an auger, dispensing lime. Positive results were evident almost immediately.

On-site difficulties developed from the need for constant maintenance and adjustments due to the dynamic conditions of the individual tributaries. West Virginia's Office of Abandoned Mine Lands and Reclamation continues to conduct routine sampling and adjustments of the doser systems twice a week, while the Save the Tygart group samples once a week.



Three Fork Creek downstream of aluminum and iron laden tributaries

The project restoration goal was to return Three Fork Creek to its designated stream usage by decreasing the water quality impairment from pre-SMRCA coal mining. To obtain restoration, focus was placed on improving water chemistry to support recreational water activities and restoring benthic macro-invertebrates and fish. This project was a partnership between West Virginia's Office of Abandoned Mine Lands and Reclamation, West Virginia University and a local watershed group, Save the Tygart.

West Virginia University and the Save the Tygart group both conducted studies to determine the options for reclamation. Various at-source AMD



Other difficulties included:

- Stream flow fluctuations
- Sediment and debris clogs in the intake
- Weather; from chemical reactions not working the same in colder weather and from freezing that shut down the systems on occasion
- Learned about damage from major storm events, mine discharges peak 2-3 days after a storm
- Difficulties in choosing what type of material to use. The office tried three types of lime. Each reacted differently depending on the site and weather conditions.
- Respiratory and eye protection was required because of lime dust to insure safety.



Plume from Three Fork Creek in Tygart Valley River at Grafton



Small Mouth Bass caught during 2012 fish survey

During a fish sampling conducted in 2010, only one fish was caught. At a second fish sampling conducted two years later, only 17 months after the official treatment of water commenced, 1,605 fish were caught and released. Water quality had improved drastically.

In the two years since reclamation, local residents have begun to once again utilize the stream for recreation. Camping and swimming have resumed along portions of the stream. Recreational fishing on the stream has also increased, with local residents reporting success.

**West Virginia DEP
Abandoned Mine Lands and Reclamation**

Mulga Gob Fire Emergency/Construction Project - Alabama

Mid-Continent Regional Award

The project began July 2, 2007 and ended March 22, 2010. Construction costs totaled \$2,731,000. Alabama Department of Labor, Abandoned Mine Land Reclamation Program was responsible for its reclamation. The Mulga Gob Emergency/Construction Project site is located in Jefferson County, about 13 miles from Birmingham, Alabama. The site is adjacent to the residential community of Mulga, four miles from several municipalities, and has creeks bordering it on three sides. What began as an emergency project with burning area coverage of approximately 32 acres, later was converted to a Priority I AML construction project, where a total of 52 acres was reclaimed.

In 1908 Birmingham Coal & Iron Company opened the Mulga mine. It changed hands a few times, but in 1951 Woodward Iron began using it as a location for refuse disposal. It's estimated that the gob pile initially contained 2.9 million cubic yards of refuse material. After the gob pile was abandoned, vegetation

flourished as well as the deer, rabbit and turkey population there. Residents used the area for hunting, fishing and due to the heights of piles, it was a popular spot for ATV riders. The original ignition source for the gob fire is unknown, but visitors frequently started fires to burn trash, or have campfires or parties. Once fire cracks came to the surface, visitation increased even more to observe the fire and smoke at night.



Current view of project site



Planting Trees on Borrow Area

It was in 2006 when the surface burning was first addressed. Months later on a routine post-monitoring inspection, an inspector observed reignited fires and smoke. The smoke combined with dense morning fog became a traffic concern, and caused vehicle crashes. The threat of fire to nearby residences as well as the danger to ATV enthusiasts was severe. The strong smell of sulfur odor and smoke related breathing issues were a concern to nearby communities. In addition, offsite sediment leaving the site flowed directly into three creeks. Dry and dead pulpwood-size pine trees provided the potential to fuel a forest fire, easily reaching neighboring communities. This project was an obvious candidate for emergency status and reclamation.

To address this emergency, the Alabama Abandoned Mine Land Reclamation Program worked with Walker County Soil & Water Conservation District Board which had experience in fighting coal gob fires, via a cooperative agreement. The flexibility afforded by this cooperative effort allowed for unlimited and instantaneous “midstream” design and construction modifications as challenges presented themselves. Cost savings from this benefit are incalculable.

Together with OSM, the agencies assessed the problem, set a goal, and developed several potential methods for a solution. They decided on the method to segregate the burning area with clay filled “fire cut-off” trenches, and capping the surface with compacted clay material, effectively sealing the fire from its source of air. Exploratory trenching revealed that nearly the entire pile was burning. Sediment control structures and other BMPs were installed at all discharge points. They also cleared all vegetation and hauled away any usable timber and pulpwood.

This method had been done before and the project design was very helpful in two future reclamations, utilizing the same method and equipment.

On-site difficulties included considering wind direction for the smoke and timing of construction tasks. Because of air quality, special health and safety measures were developed and taken for the workers.

After the gob pile had been capped, erosion control, terraces, drainage ditches and riprap were installed. A seasonal mix of grasses revegetated the area. In cooperation with Black Warrior Clean Water Partnership and a local FFA chapter, trees were planted three years after reclamation, in areas where no gob material had been placed, so not to create new air spaces in the surface.

This reclamation greatly benefits citizens in the county. Since completion, fog and smoke are no longer a major traffic concern. The Fire Department has not received any further complaints in air quality. The area is considerably safer, even for the ATV enthusiasts that still continue to frequent the site. And an added benefit from articles written in local and statewide publications, creating greater public awareness of the Alabama Abandoned Mine Land Reclamation Program, SMCRA and OSM.

Alabama Abandoned Mine Land Reclamation



Exploring Limits of Gob Fire



Silver Lake Project - Colorado

Western Regional Award

You can find San Juan County, and the Silver Lake hardrock mine reclamation project in southwestern Colorado, four miles east of Silverton. Silver Lake is a high mountain “hanging lake”, at 12,000 plus feet elevation. The project’s area elevations are extreme, ranging from 11 to 13,000 feet, with steep and rugged terrain and harsh climate most of the year. Avalanche danger occurs in the winter and spring.

Staked by John Reed in 1876, Silver Lake was one of the richest mines in Colorado, and one of the most complex and largest in the American West. At one point, the lake basin housed 500 workers year round in boarding houses, one five stories tall, with turn of the century running water and flushing toilets.

Due to Silver Lake’s remoteness, many relics of mining’s past remain on-site. The lake area became an important part of Silverton’s history. Three buildings still stand; the others lost due to avalanches or fires during past mining operations. More recently, the lake and mines have become a well-known day trek destination.

The Silver Lake area received approximately 4.5 million dollars for clean-up and reclamation when the lake’s primary landowner, American Smelting and Refining Company, went bankrupt and settled in court. In 2010 the project was funded by Colorado’s annual OSM grant, providing half of the necessary funding. State Severance Tax funding filled in the remainder.

The reclamation plan utilized Trimble GPS mapping to develop detailed land status analysis, property ownership and individual mine safety closure specifications. Due to its remoteness and high elevation, Colorado Division of Reclamation, Mining and Safety opted to survey Silver Lake in one focused event utilizing seven employees to locate the dangerous mine openings. 52 mine safety closure locations were found and characterized, uploaded into Colorado’s database where they used ArcMap to georectify land status maps in a partner effort.



Silver Lake, a “hanging lake” or “tarn” at 12,186 feet above MSL in the upper glacially-scoured cirque basin above Arrastra Gulch and the Animas River.



Silver Lake, town site in forefront, power substation and assay office still standing. This was the location of the five story boarding house and multiple other buildings.

The mine safety closures were designed to blend in with the historic nature of the site, based on current accessibility and historic significance. San Juan County Historical Society helped with site design by recommending locations of grates and doors, so that visitors could view the underground mine openings safely from the surface. Rock bulkheads made with locally scavenged rock were specified for adits with less historical significance or unstable openings.

The plan took into consideration excessive snow loading from the altitude as well as minimized land disturbance by using helicopters three days a week to transport materials and equipment. Other on-site challenges included the short construction season due to elevation. The contract was allotted two summer seasons to finish the project. However, K & P Property Design only took three months to complete it by utilizing over 11 workers, splitting into four crews and having them camp out three nights a week. Lightning was a challenge



and the crews were constantly aware of its danger. All crews were in contact via radio with the helicopter company in case of an emergency. Happily, there were no incidents during the project.

Thirty horizontal mine adits, 18 vertical shafts and stopes and one hazardous water well were safeguarded using closure methods including backfills, steel grated shaft closures, polyurethane foam closures, corrugated steel adit closures and more. The closures blend into the surroundings, while providing safety to hikers and backcountry enthusiasts. Extreme care was taken to preserve historic mining machinery.

The success of this project is two-fold; in meeting the challenges of an extreme location, short construction season and steep topography, and successful partnerships between local and state entities to preserve funding available for future use on environmental reclamations.



Worker installs the lock in a bulkhead closure.



CDRMS crew at Silver Lake in 2010, developing the mine safety closure project



Vertical openings closed with grates and locking doors. The closures blend into the surroundings, while providing safety to hikers and backcountry enthusiasts.

Colorado Abandoned Mine Land Program

Harding Pegmatite Mine Safeguard Project - New Mexico

Small Project Award Winner

The Harding Pegmatite Mine, five miles east of Dixon in north central New Mexico, is a historic and geological treasure. It has contributed to the scientific understanding of the origin of pegmatites.

A Pegmatite is an exceptionally coarse-grained igneous rock, with interlocking crystals, usually found as irregular dikes, lenses or veins.

Starting in the early 1900s, and during World War II, the unique pegmatites were economically and strategically important materials for the US. The Harding Pegmatite Mine was the world's largest producer of the mineral microlite. This material was needed to manufacture walkie-talkies and radios for the armed services. Beryl, used to make non-sparking tools for





1950s Beryl Mining at the Harding Pegmatite Mine

the development of atomic weapons, Spodumene, for thermonuclear bombs, and calcite, were also mined. Since mining ended in the 1950s, the well preserved and exposed pegmatite has been used as an outdoor laboratory for geology and mineralogy students around the world.

The mine was donated by its owner to the University of New Mexico, Department of Earth and Planetary Sciences in 1978. 3 to 4,000 people visit the site each year, including scientists, students, mineral enthusiasts and school children. There were many hazards on the site and access was easy into unpermitted areas. Parking also was a problem for the number of visitors the site was receiving.



With the high visitation rate and presence of 10 hazardous abandoned mine openings, University of New Mexico became interested in reclamation. The university, the site caretaker, and the New Mexico AML program developed a list of goals for reclamation. They planned for...

- An improvement of site access by installing a post and chair barrier around the parking lot, a heavyduty locking hinged swing gate by the entrance road, and a chain gate across the secondary access road.
- Backfilling one mine shaft using mine waste rock
- Construction of bat grates, some with and without hinged locked doors
- Construction of a corrugated steel pipe (culvert) airflow closure at an adit
- Installation of a six strand barbed wire fence along the highway, two informative and educational signs, and seven numbered marker posts for visitors to take self-guided tours

The University of New Mexico noted that due to their budget constraints, reclamation would not have occurred in a reasonable time frame without partnering with the New Mexico Abandoned Mine Land program and OSM. The University of New Mexico required some special requests due to the research potential of the site. One design challenge was to keep the underground entrances accessible to authorized personnel for scientific research. The program's engineers designed lockable hinged doors at all adit portals where access would be necessary.

The doors are also bat and small mammal accessible openings, and have the most minimal restriction to natural ventilation. This access design has been used in other similar projects.

In case of a cave-in while personnel were performing research, the other portals without entrances had to be alternative escape routes. Engineers used an innovative locking mechanism where the door can be opened from the inside without a key.

Another on-site difficulty was due to the bedrock's fragility. Percussive drilling was dangerous, so the project engineer custom designed the grating of the doors to closely follow the existing rock, minimizing drilling. Design kept the visual impact of the historic site as true as possible. Exposed steel was corrosion resistant, but it was a type of weathering steel which forms a reddish-brown patina that blends in with the environment. Close attention was given to not cover up any significant geological features.

The University of New Mexico and the Abandoned Mine Land program were both concerned about safety for the many visitors but also took into consideration vandalism and trespassing. The gates designed to be strong and reasonably vandal and bullet resistant. Hinge and doorframe designs were devised to hide the hinges and make them almost impossible to tamper with from the outside. Gates were installed on the roads that lead to the rear of the property, preventing unauthorized access to the mine, which the site caretaker noted was a problem in the past.

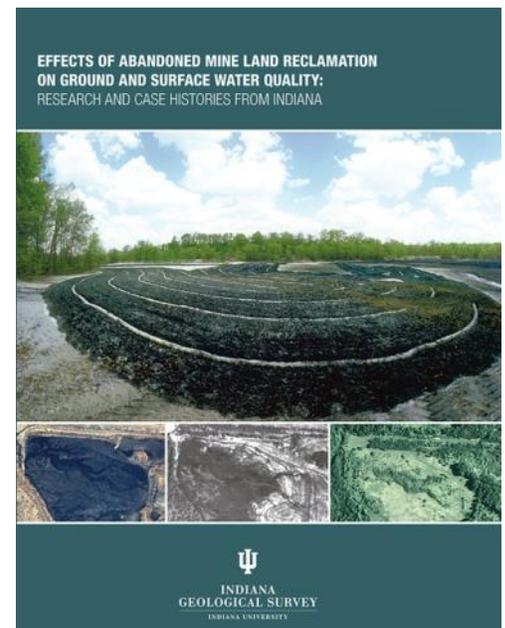
At this highly visited abandoned mine site, design and on-site challenges were met while respecting the Harding Pegmatite Mine's unique historic, geologic and mineralogic significance. The community benefits from the safer site, with enhanced ability to control access. The Harding Pegmatite Mine can now be preserved as a historic and geological treasure for years to come.



New Mexico Abandoned Mine Land Program

The Indiana Geological Survey Publishes Book On Reclamation And Water Quality

The new book, *Effects of Abandoned Mine Land Reclamation on Ground and Surface Water Quality: Research and Case Histories from Indiana*, has recently been published by the Indiana Geological Survey. This volume of thirteen papers presents the results of research investigating the impacts on ground and surface water of diverse reclamation practices designed to clean up abandoned coal mine sites in Indiana. Reclamation activities in Indiana's abandoned mine lands during the past 20 years have provided numerous opportunities to gauge the effectiveness of various remediation designs and to conduct field experiments to quantify the impact of these efforts on water quality and hydrology. Studies conducted at Indiana AML sites and controlled experiments performed in the laboratory simulating these sites have produced considerable data and provided important insights into what processes are effective in converting barren land to productive uses and reducing the outflow of acid mine drainage that leaches toxic metals from mine refuse and overburden, sterilizes downstream water bodies, and contaminates down-gradient aquifers. This volume gathers under one cover the information learned and the insights gained during the past two decades by researchers at the Indiana Geological Survey and their colleagues who have studied the natural processes and environmental impacts of Indiana's abandoned mine lands reclamation program. The book is a must for those working in coal mine reclamation, as well as useful for teachers and students studying the environmental impacts of mining.



This volume may be purchased at the [Indiana Geological Survey Bookstore](#)

NEWSLETTER ARTICLE SPECIFICATIONS

400 - 500 words. Articles subject to editing. Submit in e-mail or hard copy. 2 photo limit. Include author's name, title of article, captions for photos. Submit photos in TIF (preferred) or JPG format, 300 DPI, and original photo size. E-mail photos as individual files, not embedded.

Deadline for Spring Edition is April 15, 2014.

Email articles to Bob Scott (bobf.scott@ky.gov) or

mail articles to: Bob Scott, Director
Division of Abandoned Mine Lands
Department for Natural Resources
2521 Lawrenceburg Road
Frankfort, KY 40601

For more information call Bob Scott, Mark Meade or Ben Enzweiler at 502-564-2141.